

Serial No. 10/078,029
February 3, 2004
Reply to the Office Action dated November 13, 2003
Page 2 of 11

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (currently amended): A nonreciprocal circuit device comprising:
a permanent magnet;
a ferrite element to which a DC magnetic flux is applied by said permanent magnet;
a plurality of center electrodes provided on said ferrite element; and
a metal casing which is made of an iron-based metal and which accommodates said permanent magnet, said ferrite element, and said center electrodes,
wherein said metal casing comprises a first casing member and a second casing member, the first casing member and said permanent magnet are in magnetic contact with each other, and the second casing member has a thickness ~~between~~ greater than 50% and substantially less than 100% of a thickness of the first casing member.

Claim 2 (original): A nonreciprocal circuit device according to claim 1, wherein the second casing member comprises a pair of second casing sidewalls that oppose each other.

Claim 3 (original): A nonreciprocal circuit device according to claim 1, wherein the second casing member comprises a first pair of second casing sidewalls that oppose each other, and a second pair of second casing sidewalls that oppose each other.

Claim 4 (original): A nonreciprocal circuit device according to claim 1, wherein

Serial No. 10/078,029

February 3, 2004

Reply to the Office Action dated November 13, 2003

Page 3 of 11

the first casing member comprises a pair of first casing sidewalls that oppose each other, and the second casing member comprises a pair of second casing sidewalls that oppose each other, the first casing sidewalls and the second casing sidewalls being overlapped and joined to each other.

Claim 5 (original): A nonreciprocal circuit device according to claim 4, further comprising a resin casing member which is incorporated in said metal casing and which accommodates said ferrite element and said center electrodes, said resin casing member having contact-preventing portions provided between respective inner surfaces of the first and second casing sidewalls and a peripheral surface of said permanent magnet.

Claim 6 (currently amended): A nonreciprocal circuit device comprising:
a permanent magnet;
a ferrite element to which a DC magnetic flux is applied by said permanent magnet;
a plurality of center electrodes provided on said ferrite element; and
a metal casing which is made of an iron-based metal and which accommodates said permanent magnet, said ferrite element, and said center electrodes,
wherein said metal casing comprises a first casing member and a second casing member, the first casing member and said permanent magnet are in magnetic contact with each other, and the second casing member has a thickness between greater than 50% and substantially less than 100% of a thickness of the first casing member;
wherein the first casing member comprises a pair of first casing sidewalls that oppose each other, and the second casing member comprises a pair of second casing sidewalls that oppose each other, the first casing sidewalls and the second casing sidewalls being overlapped and joined to each other;
wherein a resin casing member is incorporated in said metal casing and

Serial No. 10/078,029

February 3, 2004

Reply to the Office Action dated November 13, 2003

Page 4 of 11

accommodates said ferrite element and said center electrodes, said resin casing member having contact-preventing portions provided between respective inner surfaces of the first and second casing sidewalls and a peripheral surface of said permanent magnet; and

wherein said contact-preventing portions have a thickness greater than that of the upper casing member, and have upper surfaces which are extended to a location higher than a bottom surface of the magnet.

Claim 7 (original): A nonreciprocal circuit device according to claim 5, wherein said resin casing member is insert-molded in said second casing member so as to integrally join the same.

Claim 8 (original): A nonreciprocal circuit device according to claim 4, wherein said second casing sidewalls overlap respective outer surfaces of the first casing sidewalls.

Claim 9 (withdrawn): A nonreciprocal circuit device according to claim 4, wherein said second casing sidewalls overlap respective inner surfaces of the first casing sidewalls.

Claim 10 (withdrawn): A nonreciprocal circuit device according to claim 9, further comprising a resin casing member which is incorporated in said metal casing and which accommodates said ferrite element and said center electrodes, said resin casing member having contact-preventing portions provided between respective inner surfaces of the first and second casing sidewalls and a peripheral surface of said permanent magnet.

Claim 11 (currently amended): A nonreciprocal circuit device comprising:

Serial No. 10/078,029

February 3, 2004

Reply to the Office Action dated November 13, 2003

Page 5 of 11

a permanent magnet;

a ferrite element to which a DC magnetic flux is applied by said permanent magnet;

a plurality of center electrodes provided on said ferrite element; and

a metal casing which is made of an iron-based metal and which accommodates said permanent magnet, said ferrite element, and said center electrodes;

wherein said metal casing comprises a first casing member and a second casing member, the first casing member and said permanent magnet are in magnetic contact with each other, and the second casing member has a thickness between greater than 50% and substantially less than 100% of a thickness of the first casing member;

wherein the first casing member comprises a pair of first casing sidewalls that oppose each other, and the second casing member comprises a pair of second casing sidewalls that oppose each other, the first casing sidewalls and the second casing sidewalls being overlapped and joined to each other;

wherein said second casing sidewalls overlap respective inner surfaces of the first casing sidewalls;

wherein a resin casing member is incorporated in said metal casing and accommodates said ferrite element and said center electrodes, said resin casing member having contact-preventing portions provided between respective inner surfaces of the first and second casing sidewalls and a peripheral surface of said permanent magnet;

wherein said contact-preventing portions have a thickness greater than that of the upper casing member, and have upper surfaces which are extended to a location higher than a bottom surface of the magnet.

Claim 12 (withdrawn): A nonreciprocal circuit device according to claim 10, wherein said resin casing member is insert-molded in said second casing member so as

Serial No. 10/078,029

February 3, 2004

Reply to the Office Action dated November 13, 2003

Page 6 of 11

to integrally join the same.

Claim 13 (original): A nonreciprocal circuit device according to claim 1, wherein the first casing member and the second casing member are joined by welds.

Claim 14 (original): A nonreciprocal circuit device according to claim 1, wherein at least one of the first casing member and the second casing member has plated surfaces comprising one of nickel and copper, and said plated surfaces are further plated with silver.

Claim 15 (original): A nonreciprocal circuit device according to claim 14, wherein said plated surfaces consist essentially of nickel plated with silver.

Claim 16 (original): A nonreciprocal circuit device according to claim 1, wherein said DC magnetic flux is unsaturated in said second casing member.

Claim 17 (currently amended): A nonreciprocal circuit device according to claim 1, wherein said metal casing comprises cold rolled carbon steelSPCC.

Claim 18 (original): A nonreciprocal circuit device according to claim 5, wherein said contact-preventing portions have tipper surfaces which are extended to a location higher than a bottom surface of the magnet.

Claim 19 (withdrawn): A nonreciprocal circuit device according to claim 18, wherein said contact-preventing portions cover substantially all of an inner surface of each first casing sidewall.

Serial No. 10/078,029

February 3, 2004

Reply to the Office Action dated November 13, 2003

Page 7 of 11

Claim 20 (original): A communication apparatus comprising at least one of a transmission circuit and a reception circuit, said circuit comprising the nonreciprocal circuit device according to claim 1.